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ABSTRACT

This data compared language complexity measures, birth information, and family data for twins and singletons of the same sex, age, and socio-economic status. The subjects were four pairs of male twins, four pairs of female twins, four pairs of opposite sex twins, and 24 singletons, 32-33 months of age. Samples of each child's spontaneous utterances were obtained on a two-hour tape recording made in the home setting and an accompanying shorthand record of ongoing action. At the same time measures of articulation and vocabulary comprehension were obtained, a Sentence Initiation Task was administered, and a parent interview form was completed. Birth information was obtained through hospital records. Significant differences between the two groups were found on the language measures, with the twins scoring lower. Rate measures (overall rate of utterance and rate of utterance to mother) were the major source of difference. No significant group differences were found on the phrase-complexity measure. Twin-singleton differences were found on all of the biological measures. It was concluded that the language development of twins may be handicapped by a biological factor of paranatal or prenatal stress and by too much sibling interaction and too little adult interaction in the acquisition of the basic semantic ideas required in advance of expression. (JMB)

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Language Difference Between Twins and Singletons - Biological, Environmental, or Both?

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The purpose of the study was to examine language complexity measures, birth information, and family data for 12 sets of 2½-year-old twins, and to compare this data with that of 24 singletons of the same sex, age, and socio-economic status. A further interest involved the relationship of complexity and rate of maternal speech to child linguistic performance. The focus of the study was language acquisition and twin development, using spontaneous speech as the base.

Most studies of twin language development report the twins progressing at a slower rate than singletons, and the questions considered here were whether differences were actually found to exist between twin and singleton groups on language measures, the nature of any such differences, and the contribution of biological, developmental, and maternal speech measures to differences among the children on the child speech measures.

The subjects were four pairs of male twins, four pairs of female twins, four pairs of opposite sex twins, and 24 singletons, 32-33 months of age. A corpus of spontaneous utterances was obtained from the children by means of a two-hour tape recording made in the home setting, and an accompanying shorthand record of speech and ongoing action. At this time, in addition, measures of articulation (DASE) and vocabulary comprehension (PPVT) were obtained, a Sentence Imitation Task was administered, and a parent interview form was completed. Birth information was obtained through hospital records.

The 48 children were scored on eleven measures of language

performance:

First, on three structural measures: (1) subject-verb, (2) verb only - thus encompassing the utterances with verb and predicate phrase components, and (3) non-sentential utterances without verb - utterances consisting of subject phrases, predicate phrases, or subject and predicate phrase combinations;

Second, on six syntactic measures: (1) mean length of utterance measured in morphemes, (2) subject phrase and (3) predicate phrase, referring to noun phrases in subject or predicate position, (4) verb complexity, based on unit complexity of verb forms, (5) additional points, given for negative phrases, conjunctions, and question forms, and (6) sentence imitation;

Third, on two rate measures: (1) overall rate of utterance, and (2) rate of utterance to mother.

Work reported by Cazden and by Miner was utilized in defining the structural and syntactic measures.

Biological measures included were birthweight and skeletal growth, gestational age, and condition at birth as measured by the 5-minute Apgar rating, which charts the infant's condition with respect to heart rate, respiratory effort, muscle tone, response to stimulation, and color.

The measures termed developmental include Articulation and PPVT, which have been considered as indicators of maturation.

The maternal speech measures were a length-complexity index, which

is a composite score based on four syntactic complexity measures (subject phrase, predicate phrase, verb complexity, and additional points scores), rate overall, and rate-to-child. As mentioned earlier, a specific interest of the study was to investigate the relationship between amount and complexity of maternal speech and child linguistic performance.

Significant differences between the two groups were found on the language measures, with the twins scoring lower. The two rate measures (Rate Overall and Rate-to-Mother) were the major sources of difference. When the syntactic phrase-complexity measures - (Subject Phrase, Predicate Phrase, Verb Complexity, and Additional Points) were considered alone, no significant group differences were found. The phrases formulated by twins were no less complex than those formulated by singletons.

In looking closely at this finding, we wondered: If the groups do not differ much in the complexity index measures, do they perhaps differ in the amount of use they make of the measures? Percentage of use figures were calculated for each of the four phrase measures (Subject, Predicate, Verb, and Additional Point), and twins were found to be significantly lower in the use of subject phrases and additional points (conjunctions, negatives, and question forms).

With regard to the independent variables, there are twin-singleton differences on all biological measures, on the developmental measures through differences in articulation, and on maternal speech

measures with the exception of overall rate of mother's speech.

The contribution to the biological, developmental, and maternal speech variables to child linguistic performance was examined through a regression analysis with the following results:

(1) All groups of independent variables (biological, developmental, and maternal speech) made significant contributions, but in the breakdown, it was found that the Apgar rating was the only individual biological measure that predicted child speech.

(2) PPVT and Articulation are particularly strongly associated with the variance of the language measures; however, since these variables are themselves speech measures as well as indicators of maturation, self-correlation is present.

(3) Of the maternal speech measures, Rate Overall and Rate-to-Child are significant contributors, but Length-Complexity is not.

Now, in looking at twin use of language, it was found that they speak less and address their mothers less often. They are found to be able to formulate sentence component phrases as competently as singletons, but their utterances tend to be shorter, and less frequently expressed in sentence (subject + verb) form.

Their mothers speak to them less, and address them in shorter utterances of less complexity than do the mothers of singletons.

This, coupled with the twins' record of addressing their mothers less frequently than do singletons, means that there is less verbal interaction between child and mother, and what interaction there is,

is characterised by a lesser degree of length and complexity. The poorer articulation noted in twins may also be related to this situation.

We have concluded that, in addition to a biological factor of paranatal or prenatal stress, lesser communicative interaction is implicated in the retarded language development commonly reported for twins - and this is considered to be the crux of the matter.

The twin situation itself may be viewed as being responsible for the language retardation in that less verbal interaction with the mother is sought, and hence exposure to adult language is restricted. Learning opportunity appears to be an influential factor. The twins may, thus, be handicapped through too much sibling interaction and too little adult interaction in the acquisition of the basic semantic ideas required in advance of expression. The growth of language by interactive use is at issue.

Environmental factors appear to be influential in encouraging use of verbal expression beyond acquisition of phrase (or sentence component) competence. The two considerations, acquisition of the ability to form component phrases, and the superordinate ability to use the skill in sentence formation appear to be separate developmental processes, in terms of environmental influences, and it is the latter in which twins are disadvantaged.